BMP

Report of Survey Conducted at

STAFFORD COUNTY PUBLIC SCHOOLS

STAFFORD COUNTY, VA

AUGUST 1994

BEST MANUFACTURING PRACTICES

BMP
Center of Excellence

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Center of Excellence for Best Manufacturing Practices

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PREFACE

During the week of August 8, 1994, a Best Manufacturing Practices (BMP) survey was conducted at the Stafford County Public Schools located in Stafford County, Virginia, considered one of the fastest growing counties in the state. Stafford County Public Schools have experienced tremendous growth since the early 1980s when enrollment stood at 9700 pupils. Currently, enrollment is at 15,000 with 20,000 projected by the year 2000. The system supports over 1100 educators and 810 staff personnel on a budget of $105M for the current fiscal year.

The survey team identified several outstanding areas at Stafford County Public Schools. These processes included the schools' efforts in communication, their outstanding recognition program, and their team approach to teacher recruitment and selection. The communication process is highly developed at Stafford County, with a comprehensive program through many avenues for effective-two way discussions with the county stakeholders. The recognition program emphasizes not only achievement, but also "continuous improvement," and has had effective results on everyone affiliated with the school. The school system also recognizes that the instructional staff is its most valuable resource and places significant importance on the teacher recruitment and selection process. This process includes active participation from the existing educator staff.
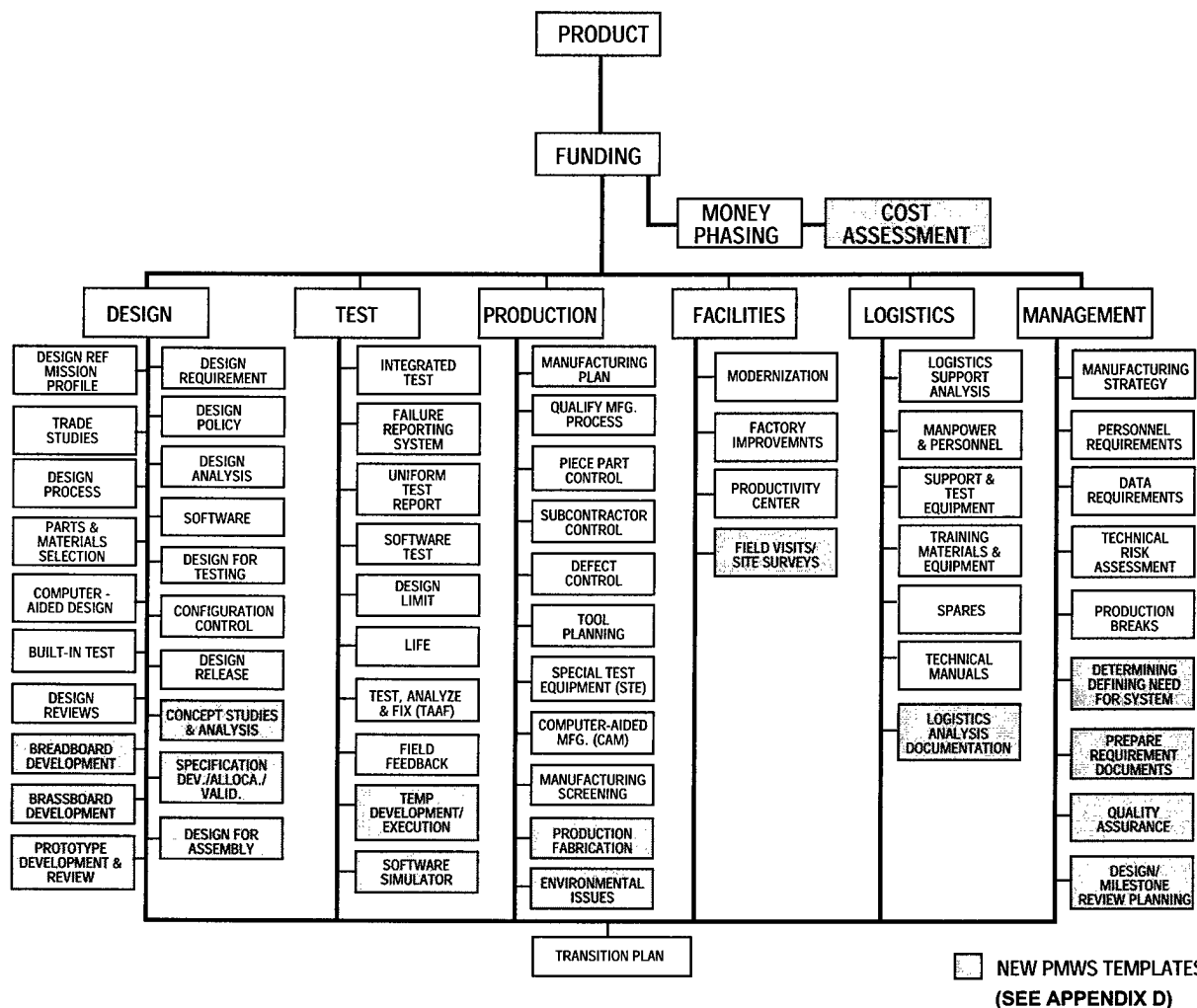
BMP surveys are conducted to identify best practices in one of the critical path templates of DoD 4245-7M, "Transition from Development to Production." This document provides the basis for BMP surveys that concentrate on areas of design, test, production, facilities, logistics, and management. Practices in these areas and other areas of interest are presented, discussed, reviewed, and documented by a team of government engineers who are invited by the company to evaluate the company's policies, practices, and strategies. Only non-proprietary practices selected by the company are reviewed. In addition to the company's best practices, the BMP survey team also reviews potential industry-wide problems that can be referred to one of the Navy's Manufacturing Technology Centers of Excellence. The results of the BMP surveys are entered into a database for dissemination through a central computer network. The actual exchange of detailed data is between companies at their discretion.

The BMP program anticipates this survey to be first of many educational institution surveys nationwide. Just as education is learning from industry, so industry and government will gain many insights into outstanding processes applicable both in their own environments as well as the academic setting.

The Best Manufacturing Practices program is committed to strengthening the U.S. industrial base. Improving the use of existing technology, promoting the introduction of enhanced technologies, and providing a noncompetitive means to address common problems are critical elements in achieving that goal. This report on Stafford County Public Schools will provide you with information you can use for benchmarking and is part of the national technology transfer effort to enhance the competitiveness of the U.S. Industrial Base.

"CRITICAL PATH TEMPLATES
FOR
TRANSITION FROM DEVELOPMENT TO PRODUCTION"

PRODUCT

FUNDING

- MONEY PHASING
- COST ASSESSMENT

DESIGN
- DESIGN REF MISSION PROFILE
- TRADE STUDIES
- DESIGN PROCESS
- PARTS & MATERIALS SELECTION
- COMPUTER - AIDED DESIGN
- BUILT-IN TEST
- DESIGN REVIEWS
- BREADBOARD DEVELOPMENT
- BRASSBOARD DEVELOPMENT
- PROTOTYPE DEVELOPMENT & REVIEW
- DESIGN REQUIREMENT
- DESIGN POLICY
- DESIGN ANALYSIS
- SOFTWARE
- DESIGN FOR TESTING
- CONFIGURATION CONTROL
- DESIGN RELEASE
- CONCEPT STUDIES & ANALYSIS
- SPECIFICATION DEV./ALLOCA./ VALID.
- DESIGN FOR ASSEMBLY

TEST
- INTEGRATED TEST
- FAILURE REPORTING SYSTEM
- UNIFORM TEST REPORT
- SOFTWARE TEST
- DESIGN LIMIT
- LIFE
- TEST, ANALYZE & FIX (TAAF)
- FIELD FEEDBACK
- TEMP DEVELOPMENT/ EXECUTION
- SOFTWARE SIMULATOR

PRODUCTION
- MANUFACTURING PLAN
- QUALIFY MFG. PROCESS
- PIECE PART CONTROL
- SUBCONTRACTOR CONTROL
- DEFECT CONTROL
- TOOL PLANNING
- SPECIAL TEST EQUIPMENT (STE)
- COMPUTER-AIDED MFG. (CAM)
- MANUFACTURING SCREENING
- PRODUCTION FABRICATION
- ENVIRONMENTAL ISSUES

FACILITIES
- MODERNIZATION
- FACTORY IMPROVEMNTS
- PRODUCTIVITY CENTER
- FIELD VISITS/ SITE SURVEYS

LOGISTICS
- LOGISTICS SUPPORT ANALYSIS
- MANPOWER & PERSONNEL
- SUPPORT & TEST EQUIPMENT
- TRAINING MATERIALS & EQUIPMENT
- SPARES
- TECHNICAL MANUALS
- LOGISTICS ANALYSIS DOCUMENTATION

MANAGEMENT
- MANUFACTURING STRATEGY
- PERSONNEL REQUIREMENTS
- DATA REQUIREMENTS
- TECHNICAL RISK ASSESSMENT
- PRODUCTION BREAKS
- DETERMINING DEFINING NEED FOR SYSTEM
- PREPARE REQUIREMENT DOCUMENTS
- QUALITY ASSURANCE
- DESIGN/ MILESTONE REVIEW PLANNING

TRANSITION PLAN

☐ NEW PMWS TEMPLATES
(SEE APPENDIX D)

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FIGURES & TABLES

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SECTION 1

EXECUTIVE SUMMARY

1.1 SITE OVERVIEW

Stafford County is considered one of the fastest growing counties in the State of Virginia. Located 35 miles south of Washington, DC, the county covers over 277 square miles. Stafford County Public Schools have experienced tremendous growth since the early 1980s when enrollment stood at 9,700 pupils. Currently, enrollment is at 15,000 with 20,000 projected by the year 2000. The system supports over 1100 educators and 810 staff personnel on a budget of $105M for the current fiscal year. The School Board for Stafford County is comprised of seven members representing each of six magisterial districts with the seventh member selected at large. All are appointed by the School Board Selection Commission and serve staggered, four-year terms.

Although the BMP program has long maintained a relationship with the academic community, Stafford County Public Schools represented the first educational survey. Processes remain the same across a spectrum of environments; however, at Stafford County Public Schools the end "product," mind-set, and atmosphere were substantially different than any other previous survey site. The survey team identified several outstanding areas at Stafford County Public Schools. These processes included the schools' efforts in communication, their outstanding recognition program, and its team approach to teacher recruitment and selection.

The communication process was highly developed at the Stafford County Public Schools, with a comprehensive program through the School Board, round-table discussions, open forums, public meetings, and special agencies. Because stakeholders in the school system encompass many people, the need for effective communication in conducting all aspects of the school system's operations is critical. Stafford's communication process acknowledged the importance of an interactive flow of information. With four levels of communication, Stafford County Public Schools ensure the success of the school system through effective interaction, and with involvement of all stakeholders.

The Stafford County Public Schools recognition program is an important part of the education package. Positive reinforcement of all the students, faculty, and community is its main goal, and recognition efforts are far beyond any the BMP survey team has seen in industry or government. With emphasis not only on achievement, but also "continuous improvement," the recognition program has had effective results affecting everyone affiliated with the school.

Teacher recruitment and selection is also an important process crucial to the educational survivability of a school system. Not only is the instructional capability of a teacher important, but also the ability to work with other teachers and staff. Stafford County has broadened its recruitment scope and involved classroom personnel in interviewing and selecting potential educators. By incorporating both points in its process, the county school system has been able to attract and hire the best individuals to support the needs of the students.

The BMP Program anticipates this survey to be one of many of educational institutions nationwide. Just as education is learning from industry, so industry and government will gain insights into outstanding processes applicable both in their own environments as well as the academic setting. The BMP survey team determined the following items to be best practices or information items at the Stafford County Public Schools.

1.2 BEST PRACTICES

The following best practices were found at Stafford County Public Schools.

Item	Page
Saving Taxpayers' Dollars	**5**

The Stafford County School Corporation saves money by sharing services with other county services and facilities.

Recap Tire Test	**5**

The Stafford County Public Schools used a life expectancy test for recapped tires to determine best value.

Planning and Construction	**5**

The demographic system developed by the Stafford County Public Schools allows the prediction of enrollments for a six-year period by grade, subdivision, area planning unit, school, and countywide. These projections are then used to develop building plans for new schools, additions to existing schools, or changing attendance zones.

1.3 INFORMATION

The following information items were identified at the Stafford County Public Schools:

Item	Page		Item	Page

Automated Bus Routing   15

The Stafford County Public Schools are converting from a manual bus routing system to an automated system that accounts for constraints and generates an optimized set of bus routes.

Staff Development Seminars   16

The Staff Development Seminar Program offers nearly 250 personalized, hands-on seminars in 13 different need areas for professional development. The program is more flexible and effective in meeting individual and school system needs than traditional teacher in-service training approaches.

Performance Appraisal   16

Stafford County Public Schools utilize the personnel improvement plan and evaluation as a means to promote professional growth.

1.4 SITE POINT OF CONTACT

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SECTION 2

BEST PRACTICES

2.1 FUNDING

COST ASSESSMENT

Saving Taxpayers' Dollars

The Stafford County School Corporation applies a unique approach to saving taxpayer money by consolidating and sharing other county services and facilities. Fund raising, business alliances, and state and federal grants also generate income that does not burden the local budget. These combined efforts save the taxpayers thousands of dollars annually.

There are several examples of this program including sharing a central garage facility that maintains vehicles for both the county and school system. A common procurement system is maintained for common goods and services and centralized purchasing for items over $500. Items not required on a full-time basis are purchased with joint funds to lower costs to each.

Special needs are also shared with other school districts in the region. For example, because the number of autistic students in each school district is small, one class has been developed for a five-school district region to meet special needs. Staff development and in-service education are also shared within the region to distribute costs for speakers in education.

Vocational students build needed products, thereby gaining valuable training while constructing furniture or meeting printing needs.

Approximately 50 school-business partnerships exist throughout the school district, providing funding to enhance instructional programs and extracurricular activities. The county school system staff received $300K in grant revenue from the state and federal government for the 1992-93 academic year. Fund raisers by support groups accounted for over $400K for the school division in the same time period.

2.2 TEST

DESIGN LIMIT

Recap Tire Test

The Stafford County Public Schools Central Garage developed a Recap Tire Test to determine which tire used on its vehicles was the most cost effective. This testing demonstrated that the tire style purchased from the lowest bidder was not necessarily the best value as one slightly more expensive.

To determine the best value tire, three different brands were purchased, installed on the rear wheels of six buses, and monitored for a two-year period. Bus routes with similar characteristics such as number of stops, number of students, type of road traveled, and amount of express mileage were chosen to ensure accurate results. During each bus' routine maintenance, the tread wear was measured with a tread depth gauge on all four rear tires. The average tread depth was used to determine the approximate life of the tire. The tires were replaced when 5/32-inch tread was remaining, and the mileage was recorded.

The results in Table 2-1 illustrate the average mileage and cost per thousand miles for each tire set and indicate the lowest cost per thousand miles is the best value. Because Virginia State law states that when the lowest cost is not the lowest bidder in price, it can be rejected and the most cost effective tire can be purchased, Stafford County was able to purchase the most cost effective tires for its school vehicles.

2.3 FACILITIES

FACTORY IMPROVEMENTS

Planning and Construction

The Stafford County Public Schools have developed a demographic system that can report current student enrollments and project enrollments for the next six years. This projection system aids the Construction and Planning Department to plan and manage the acquisition and upgrade of facilities to support the instructional program. The Construction and Planning Department planning process includes maintaining the demographics database, projecting future enrollments, developing and maintaining a six-year capital improvements program, and planning for all phases of construction projects. The department also assists Stafford County in reviewing proposed community development projects to provide insight into impacts on school attendance.

The demographic system uses the current student database and projection factors to develop projected enrollments after accounting for retention/promotion rates per

TABLE 2-1. SCHOOL BUS RECAP TIRE RESULTS

Tire Brand	Bandage D4300		Associated Drive Lug		Apex Radial Recap	
Bus No.	76	157	74	90	36	88
Mileage Installed	21,664	40,668	22360	8,062	24,421	10,755
Date Installed	06/07/91	06/07/91	05/23/91	05/23/91	06/12/91	06/12/91
Mileage Replaced	68,117	84,252	50,827	44,119	47,076	33,003
Date Replaced	04/26/93	02/05/93	11/18/92	01/29/93	08/03/92	03/16/93
Total Miles Per Tire Set	46,453	43,584	28,467	36,057	22,655	22,248
Average Mileage Per Tire Set	45,019		32,262		22,452	
Cost Per 1,000 Miles	$1.50 (@ $67.50 per tire)		$1.87 (@ $60.25 per tire)		$2.78 (@ $62.45 per tire)	

grade, special education, and kindergarten enrollments. It is refined by adjusting the growth component as new subdivisions are approved. The output is also used for personnel planning, textbook requirements, forms and supplies requirements, and budget projections.

The demographic system was developed over several years from a small program purchased for $5K. With the rapidly changing student base, the program has allowed the schools to maintain the student/teacher ratio at or below 24 to 1.

Energy Management Plan

The Stafford County Public Schools addressed a costly energy issue in 1989 by installing an energy management system. Previously, heating, ventilation, and air conditioning maintenance requests resulted in an employee being dispatched to the facility to investigate the problem. The employee transit time as well as vehicle expenses were time consuming and extreme. Stafford County also recognized that setbacks on the temperature during times that buildings were not in use could save on energy costs.

Barber Coleman, Inc. was selected as the energy management consultant and controls supplier. Since 1989, ten facilities have been connected to the system with four more scheduled to be connected by the third quarter of 1994. The system monitors air temperature, regulates air discharge, and controls the heating, ventilation, and air conditioning system for special school functions. Operations and Maintenance personnel were previously not promptly informed of special functions. Now, the function host sends a facsimile request for the time period that the facility will be in use, and the system is programmed at the Operations and Maintenance facility to control the climate for that period. In the spring of 1994, the Trane Company was selected to provide the energy control system for a new facility under construction.

Problems are investigated at the Operations and Maintenance facility without dispatching personnel to the building. Monthly comparison data is maintained to identify equipment that may need additional maintenance performed, and emergency heating, ventilation, and air conditioning calls have been significantly reduced. The supervisor can

also access the system with a personal computer from his home to troubleshoot problems or adjust the system if necessary during weekends, off-hours, or holidays. Personnel can now dedicate more time to preventive maintenance operations on regular 120-day intervals.

2.4 LOGISTICS

TRAINING MATERIALS AND EQUIPMENT

Elementary School Bus Rider Safety Program

The Stafford County Public Schools purchased a robot bus in 1992 help train children about bus safety. Virginia schools are required by the State Department of Education to provide bus rider safety training to all children in preschool through first grade. A memorial fund, established in the name of a child killed while waiting for a school bus, has allowed the school system to purchase this robot bus as a training tool.

The bus (Figure 2-1) illustrates appropriate actions for students while waiting for, riding, and exiting a school bus. Two people present the training with the robot bus, one remotely controlling the bus and providing the voice of the bus, while the other person is visible and provides commentary. Each year the robot bus is transported to all elementary schools in the county. The robot's sights and sounds have captivated the children and provided more effective training than using traditional approaches such as tapes or lectures.

LOGISTICS SUPPORT ANALYSIS

School Nutrition Services

Several practices used by the Stafford County Schools Nutrition Services have helped the school system to efficiently enhance its services, accountability, and public image. These practices include using a special software program to track student accounts and food inventory, unique applications of its catering program, instituting a breakfast program for students, and using Lotus 1-2-3 spreadsheet software to assist the director and cafeteria manager with staffing levels.

A software program called the School Nutrition Accountability Program helps Stafford County track student accounts and food inventory. Each student is issued a card with an account number that is electronically read at a terminal in the lunch line. The terminals are connected to a computer in the central manager's office that transmits daily information to the School Nutrition central office computer. A student's purchases are recorded, and the
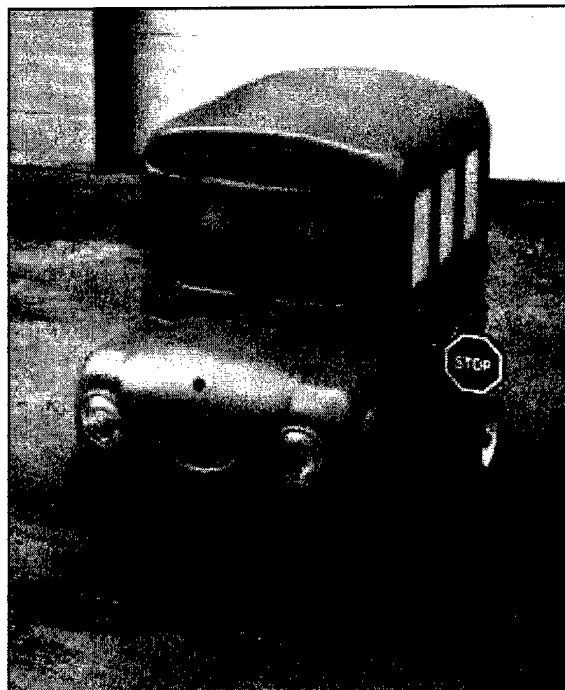
FIGURE 2-1. ROBOT BUS TRAINING AID

account balance is adjusted. If the account balance is low or insufficient for purchases, the student receives a notification to pay on the account.

The use of the student cards provides several benefits including data collection. The quantity of food items purchased helps the cafeteria manager plan for future meals as well as track inventory. As the federal government mandates nutrient requirements for the student meals, the computer tracking can accommodate individual components such as fat and carbohydrate content to be recorded and verified as needed. With this program, students are not required to carry cash for food purchases; those students on the free or reduced cost lunch program can maintain anonymity; and parents can request a printout on student purchases at any time.

A second program instituted by Stafford County Schools Nutrition Services is its catering program. The Nutrition Services frequently caters large school functions such as building dedications and proms, and personnel are selected from across the school system to assist in their individually skilled areas. This practices distributes the burden, as well as utilizes workers with special talents such as cake decorating. In addition, catering these activities with school personnel has enhanced the public image of the school nutrition services.

Stafford County Public Schools have also initiated a breakfast program for students who normally do not have an

opportunity to eat a breakfast. Students who qualify for this program because of family income now receive a nutritious meal before beginning classes. This effort by the School Nutrition Services has resulted in a reportedly increased student productivity level.

The School Nutrition Services uses Lotus 1-2-3 spreadsheet software to assist the director and cafeteria manager with staffing levels. Previously, items purchased a-la-carte were not reflected in meals purchased — a critical component for determining staffing requirements. However, using a spreadsheet allowed these figures to be credited with equivalent meals. By entering the cash income, staffing requirements are determined assuming a given number of meals per hour are to be served.

2.5 MANAGEMENT

MANUFACTURING STRATEGY

Financial Management System

Stafford County Schools have initiated a re-engineering of their financial management systems. This process, begun in 1985, entails automating and formalizing the accounting, purchasing, and budgeting processes.

Stafford County's Financial Manual provides an example of this re-engineering effort. The manual includes information on all situations in which administrators, instructional staff, or volunteers may address financial issues and/or procurement. Because of the county's rapid growth and large budget, all personnel who handle finances are instructed in the manual's use. This ensures consistency of guideline application. Sections consist of:
- General information and miscellaneous guidelines.
- Cash receipts, sales and fund raising.
- Purchasing and accounts payable.
- Activity funds that deal with non-state or county appropriated funds.
- Fees and charges.
- Payroll, benefits, and deductions.

The manual includes both explanatory text and sample forms and provides a basis from which the auditing authorities develop their annual auditing plans and procedures. The document is continually updated to meet improvements or changes in school system operations or in State and County laws and regulations.

A critical component to the manual's success is the willingness of the personnel managers in the finance department to listen to their customers, many of whom are not professional accountants or business people. There has been a documented willingness to modify the system to be "people" friendly rather than requiring the user to accommodate the computer system and rules.

Reaching Out - The Communication Process

The Stafford County Public Schools have developed a highly effective communications process that reaches out to and actively involves the broad base of stakeholders within the system and throughout the county community. This process has been developed in response to the need for effective communication in conducting all aspects of the school system's operations. Decision making in the public environment can be cumbersome and slow. Typically, public hearings must be held, cognizant committees and boards must meet, and special interest and advocacy groups must be consulted. Student needs and the concerns of parents are always important considerations.

Stafford's communication process recognizes the importance of a two-way flow of information, with emphasis on listening. There are four levels of communication - School Board to stakeholders - School and Community interactions, Superintendent to Staff, and Principals and Directors to their staffs.

School Board

The School Board reaches out to groups within the school system and the community through a variety of means to assure broad participation and input in the decision making process. Figure 2-2 depicts many of the groups that interact with the Board through round-table discussions, committees, task forces, public meetings, and special agencies.

Round-table discussion meetings are conducted between School Board members and teachers in elementary, middle, and high schools periodically. They are a forum for open communications, providing teachers with an opportunity to raise concerns, ask questions, and receive feedback. Although immediate resolution in many cases is not possible, a written response will be published and posted in the schools. Student Round-table meetings, held with the middle and secondary school students, maintain an informal agenda that stimulates the two-way communication process. Students not only have an opportunity to present their concerns, Board members also have the opportunity to ask students questions.

Standing Committees provide the Board with advice on health, vocational training, gifted programs, special education, and Head Start programs. Citizen task forces provide input to the Board in areas of special interest such as weapons in the schools and educational needs for the next century.

The Board conducts regular public hearings on the budget and special hearings on topics such as implementing a day-long kindergarten program or changing attendance
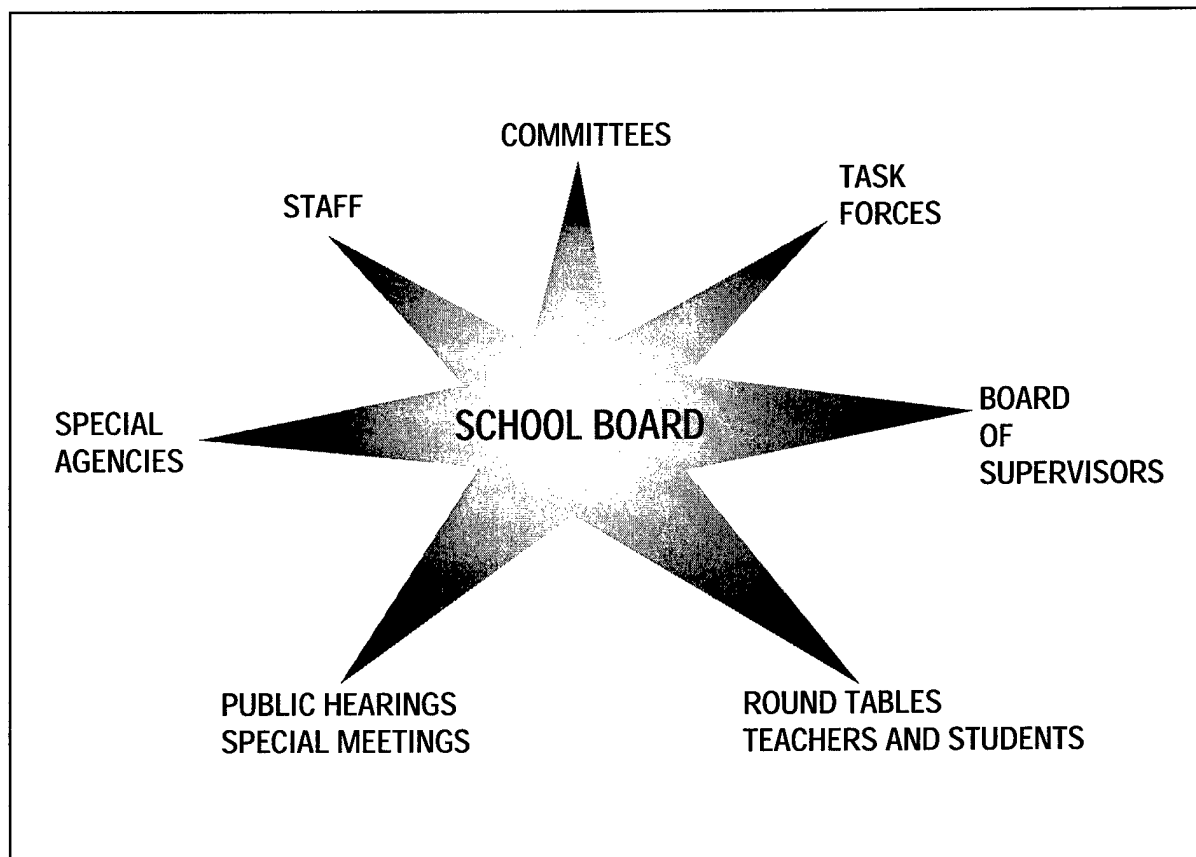
FIGURE 2-2. SCHOOL BOARD REACHES OUT

Diagram labels: COMMITTEES, STAFF, TASK FORCES, SPECIAL AGENCIES, SCHOOL BOARD, BOARD OF SUPERVISORS, PUBLIC HEARINGS SPECIAL MEETINGS, ROUND TABLES TEACHERS AND STUDENTS

zones. There are special meetings with concerned citizens to address high interest topics. Regular Board meetings provide opportunities for the Board to hear comments from citizens, parents, administrative staff, and support groups like PTA. The School Board has also attended a retreat with the school system leadership team to improve communications and understanding.

School and Community

School and community interactions include business partnerships, a monthly newsletter to parents, student handbooks, special presentations to parents and community groups, and student performances in the community. One unique communication program is the Homework Hotline, a popular and well-used program. Parents and students can call this hotline to verify and get help with homework assignments. Other communication mechanisms include interactions with PTA and support groups, parent participation on textbook adoption committees, open houses, and parent/teacher conferences.

Superintendent to Staff

The Superintendent and his immediate staff use a number of methods for internal communication. These include weekly meetings of the Superintendent with the Assistant Superintendents, monthly administrators meetings, the Superintendent's Teacher Advisory Group, and Superintendent's Cluster Groups for Service Personnel.

Principals and Directors to Staff

Within each school and other system facilities, the principals and directors use advisory groups, staff meetings, and leadership teams as effective means for communication.

Communications is an essential element of all business processes in the Stafford system. Because of its importance, Stafford has built a solid working relationship with the media. A significant amount of time and effort is devoted to providing information to the media and responding to media inquiries. Good media relations have contributed to a strong, positive image of the school system in the

community and have provided an effective means for disseminating information to the public.

The Stafford County Schools have effectively applied the communication processes to assure the success of the school system though effective interaction and involvement of all stakeholders. Benefits include an informed and participative community, more efficient and effective decision making, faculty and support staff involvement, and enhanced capability to meet student and community needs. This effort translates to customer satisfaction at all levels.

The Procurement Process

The Stafford County Public Schools follow a set of well-established procurement guidelines and innovative practices for buying all products and services. Procurements range from books to a fleet of 165 buses, with services encompassing all items from building construction to medical insurance. With a current annual operating budget of $105M, the procurement system would not be able to operate without using every cost savings opportunity.

These guidelines are necessary to handle the fastest growing school division in Virginia. The Stafford County Public Schools procurement system is responsible for the purchase of products and services it provides for 15,000 students, 1116 teachers, administrators, staff, 810 full and part-time support staff, and 18 elementary, middle, and high schools.

Centralized purchasing, including the county government and the School Division operating under the Virginia Procurement Act, is a key component of the purchasing process. A set of common procurement procedures is followed for small purchases, competitive sealed bids/proposals, and professional services. Other components include the authorization given to a school/department site principal or supervisor to purchase items costing less than $500 without additional approval and quotes. Cooperative procurements are permitted to allow one school division to ride bids secured by another school division.

An historical database is maintained denoting responsible and responsive bidding practices, pricing trends, and delivery of all vendors doing business with the State, the county, and the school system for the purpose of developing vendor profiles. The school system has established memberships in certain low-cost consumer warehousing establishments for purchases at reduced prices on many items, and a food warehouse has been established to take advantage of USDA commodities. Stafford County can also obtain surplus items from the government laboratories and industrial activities prior to these items being sold at auction.

The Stafford County Public Schools, through continuous improvement efforts and adaptation of innovative procurement practices, has not only taken steps to reduce costs for products and services, but reduce the administrative costs for securing quotes and bids, awarding contracts, ensuring quality, and expediting delivery at substantial savings to the county taxpayers.

Six Year Plan

Stafford County Public Schools' Six-Year Plan outlines the goals and objectives for the long-range instructional planning to deliver contemporary education, enable students to reach higher achievement levels, and maintain the lead over other K-12 education systems. The Six-Year Plan is developed by a committee drawing on knowledge and experience of its members who are from within the Stafford County Public Schools.

The Plan is coupled with the Education 2000 and Beyond Task Force that is commissioned by the Stafford County School Board to develop a strategy to guide the school system into the 21st century. The Six-Year Planning committee annually updates the plan in collaboration with School Board members, teachers, administrators, community members, and the Education 2000 and Beyond Task Force. The committee eliminates completed objectives or those no longer needed, revitalizes others, and adds new ones. The plan includes goals, objectives, action strategies, completion dates, and who is responsible for implementation.

Important factors addressed in the Six-Year Plan include cultural and ethnic diversity, social issues of the country, subject matter of the curriculum, challenging the high achiever, and the information explosion. Major components of the goals and objectives of the plan that address the contemporary needs of education include new emphasis on technology as a subject and a classroom tool, cooperative learning methods, developing thinking skills, expanding communication networking opportunities, addressing the global economy, providing for a multi-cultural education, expanding instructional assessment practices, continuing staff development, and developing an appropriate monitoring system with metrics to assess the performance of the plan.

The Six-Year Plan, coupled with the Education 2000 and Beyond Task Force, provides the framework to shape and form a sound education process to keep pace with county and nationwide changes.

PERSONNEL REQUIREMENTS

Employee Benefit Plans and Flexibility

The Stafford County Public Schools employee benefits program has several unique and important elements that reflect the management's belief that the financial system should support its employees.

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Through judicious selection from competitive bids, the school system has been able to lower its per employee premium costs while maintaining the same base of coverage. It has also provided a comprehensive liability insurance package coverage to volunteers who provide services to the schools. Considered unpaid employees, the volunteers have been included in the same bid package without a penalty. Employees can also change coverage and/or a benefit package any time during the year (some exception is made toward the end of a fiscal year). There are no strict enrollment periods or waiting until the next cycle before changes can be made.

Personnel in the financial affairs office, as well as the Assistant Superintendent of Finance, maintain a philosophy that the school employees are their customers, and their customers want lower costs, as well as the flexibility to add or subtract benefits and make changes.

The Recognition Process

The Stafford County Public Schools' recognition program is comprehensive, encourages innovative techniques, and is an important part of the total education package. "Accentuate the positive" is the driving theme adopted by school administrators, teachers, students, and the community. The program is designed for all to participate, either as a receiver, or as a giver, and often as both.

Where most schools recognize high academic and athletic achievements for their students, the Stafford County Public Schools additionally recognize behavior and special achievement, and encompass all K-12 students, as well as teachers, administrators, and the community. Common in most schools are the recognition of academic achievement through Honor Rolls, scholarships, and Student of the Month; the athletic achievements through Team awards, Athlete of the Month, and Scholarships; and teacher recognition through Outstanding Teacher nomination, Teacher of the Month Club, and Teacher's Week. The practice in most public school divisions is to place the total burden of carrying out and managing the recognition process at each school site on the administrative staff and teachers.

Unique to the Stafford County Public Schools recognition program approach is the involvement of the total school population, as well as the community, the media, and the local businesses which has led to some innovative recognition processes. An important part of the School Board's bimonthly meetings is to begin with an awards program that recognizes the winners of the Outstanding Teachers Program, Outstanding Principal Program, Student Achievement winners, awards for special teachers, staff, and support groups, special recognition of community businesses, retirees recognition, and length-of- service awards. The

Superintendent distributes "You're Good" certificates, sends out letters of commendation to employees and outside support groups, letters to speakers and special support groups, and notes to employees experiencing lengthy illnesses or deaths in the family.

Advertisements are purchased in the local and community newspapers to salute outstanding teachers, students, and support groups. Weekly news articles are provided to local newspapers and radio stations that identify recent award winners. The school system has a partnership with the Washington Post to run a national feature recognizing several of the recipients of Stafford's Outstanding Teacher recognition awards.

Also unique in the recognition process is the Positive Phone Calls Home program with teachers and principals calling the parents of students and offering praise and recognition for their son's or daughter's recent achievements. An honor roll has been established for recognizing students not for their academic achievement, but for their academic improvement and continuous hard effort. While most high schools use their newsletter to recognize recipients of awards, one high school airs a special achievement program for the entire student body on their in-house TV station.

Positive reinforcement of all the students, faculty, and community is the goal of the Stafford County Public Schools. The comprehensive recognition program of this magnitude has placed the Stafford County Public Schools' recognition efforts far beyond the norm, and with effective results that are embraced by everyone affiliated with the school.

Recruitment and Selection Process

The Stafford County Public Schools system has developed a process to effectively recruit and select the best teachers to work with and support the needs of Stafford County students. The school system recognizes that the instructional staff is its most valuable resource and places significant importance on the teacher recruitment and selection process. It is a collaborative process involving teachers, administrators, and the Personnel Department. Staffing decisions are based on individual school demands influenced by factors such as student needs, staff dynamics, and desired expertise and skills.

Personnel related decisions were previously made by one or two individuals based on perceived school system needs. Instructional staffing requirements were discerned as effectively addressed without actively recruiting candidates from outside of the immediate area. Consequently, campus visits were limited and advertising and marketing strategies were minimal. However, since 1980 the county has experienced almost a 5% growth in student population each year, growing from 9700 to more than 15,000 students. In that time, the

instructional staff has nearly doubled to more than 1100 to keep pace with the county's commitment to maintain optimal pupil-teacher ratios. Cultural diversity has accompanied growth, requiring more emphasis on minority representation among the staff as well as more resources for language programs. There have also been major philosophical shifts in management practices. There is now an increased focus on providing more opportunity for the total instructional staff to become involved in the decision-making process that has influenced recruitment and selection. The school system has shifted its recruiting focus from the local community to a geographical area covering the entire eastern United States to increase the size, diversity, and quality of the pool of potential candidates.

Through judicious application of TQM measures, the Stafford County Public Schools have developed and implemented a thorough, cordial, and fair methodology for recruiting and selecting new teachers. The formal process first defines the ever changing needs of the schools for new types of instruction, and then discerns where personnel who have the appropriate expertise reside - a very important step. A methodology for training recruiters - many of whom are teachers from the schools - is then developed which includes interviewing techniques and procedures (Figure 2-3).
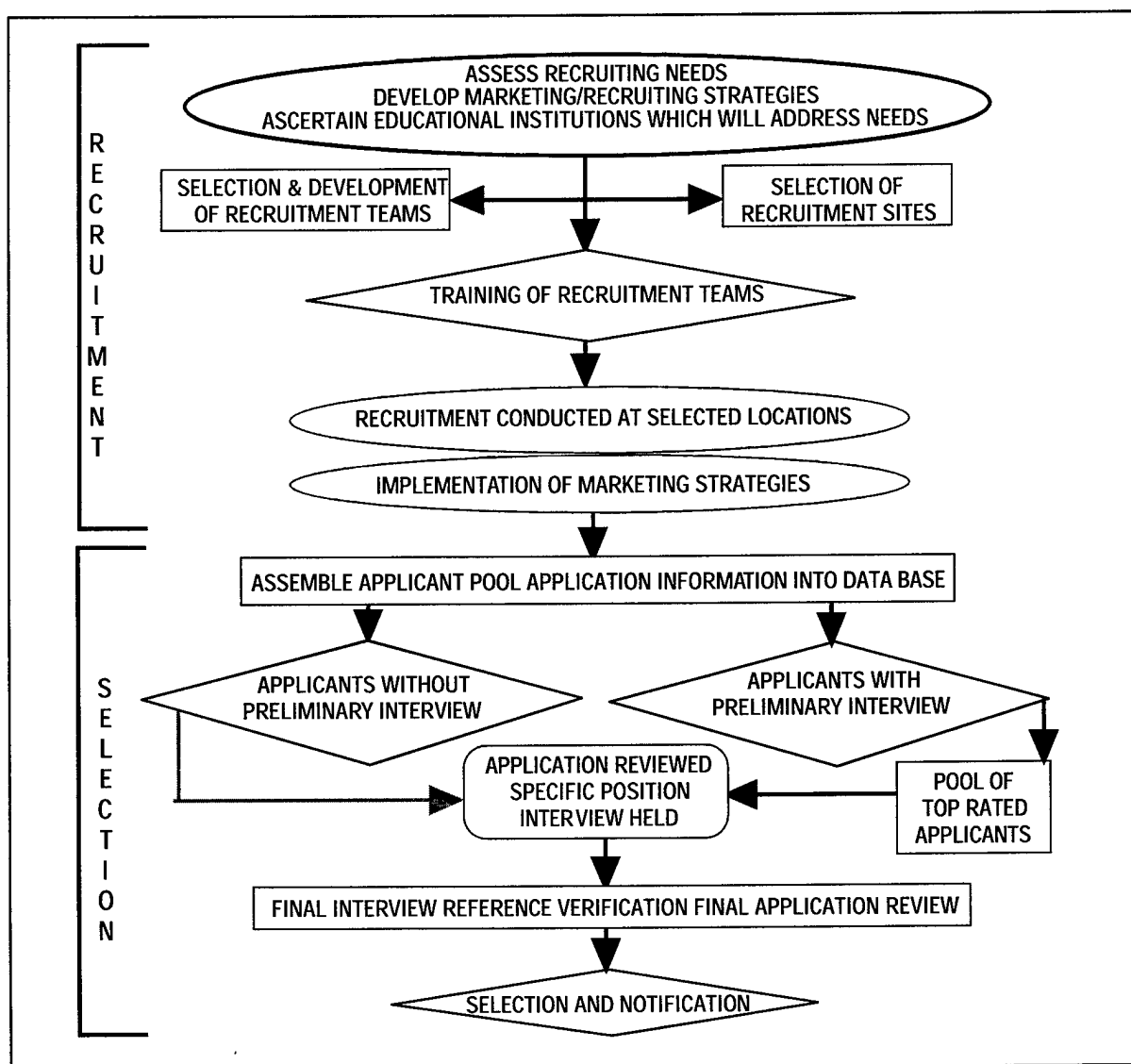

FIGURE 2-3. TEACHER RECRUITING PROCESS

After assembling an applicant pool that includes grouping submitted resumes and preliminary applicant interview forms, specific candidates are interviewed on campus by both administrators and fellow faculty members with whom they will be working. Checks are then made of references, final interviews conducted, and final application reviews made. Successful applicants are then selected and notified.

The cordiality of the administrators, faculty, and staff during the interview process has been well received and commented on by all applicants. The enthusiasm of both the administrators and the teachers during the interview process, combined with conscientious procedures used to recruit and select personnel, are key contributors to the success of the program. Increasing the depth, diversity, and quality of the pool of candidates have achieved highly favorable results.

DATA REQUIREMENTS

Automation of Management Systems

Since 1990, the Stafford County Public Schools have used a systematic approach to automate their administrative and support functions. Additionally, the schools are acquiring new computer networks to provide students with a high quality computer education. The school system's computer capabilities now equal or exceed those of other K-12 education systems. Before 1985, the Stafford County Schools had no automated data processing equipment, at which time the county began using MS DOS machines for administrative jobs. There are currently 136 administrative users, and in 1990, an IBM AS/400 and all schools in the county system were brought on line.

The school system has used many approaches to control the cost of its system while ensuring that the system provides the necessary functionality. A few examples of these approaches are:

a. All network users must share one database which eliminates duplicate data entry and accuracy problems associated with multiple databases.

b. Before purchasing any software or programming a module in house, an analysis is conducted to determine the most cost effective approach.

c. In order to implement automation in areas where resistance is expected, a willing pilot site is selected and the new system is proven there first and then rolled out to the other sites.

d. Weekly reports are used that give each staff member a chance to show accomplishments, problems, and goals for the next week. This simple approach keeps communication lines open.

e. Staff members are cross trained in multiple areas.

Budget Process

The Stafford County Schools budget process employs effective communication strategies to develop requirements and gain approval throughout the community. The budget summarizes all planned programs, providing an annual plan for coordinating the revenue and expenditures for the school system. The school system considers it very important to all stakeholders including parents, staff, and other taxpayers in the county. While some components of the process are regulated by the Code of Virginia, most are locally dictated and far exceed state norms.

Stafford County Public Schools did not have a documented budget process before 1985. In response to accelerated growth and a need for improved management, a budget process was developed, implemented, and continually improved to meet the changing need of the school system.

A key enabler of the budget process is the communication process at Stafford. A common practice throughout all business processes at the Stafford County Public Schools, numerous forums have been established to ensure a two-way flow of information that encompasses the ideas and concerns of all stakeholders. A budget calendar (Figure 2-4) clearly defines the process with exact dates for input, meetings, and written requests. It is approved and distributed to all administrators, media, county staff, and the Board of Supervisors.

Scheduled opportunities for input are provided at several levels. At the site level, principals include and document input from staff, students, and parents. Representatives of employee groups are invited to make presentations to the School Board relevant to their needs and concerns. Support groups and other citizens are invited to address their needs to the School Board through a series of public hearings. There are also opportunities to explain the budget to interested parties. Special administrators' meetings are held to discuss specifics with each school site and department. Special sessions are held with the media to explain the budget and answer questions just prior to public release.

Formal presentation of the budget to the community is accomplished through a multi-media format with emphasis on graphical representation of key information to make it easily understandable. Hard copies of the presentation are made available.

Two unique characteristics of the budget process also include the Board of Supervisors, which is responsible for budget management. The Board will allow a school to keep any surplus from one year to the next, and also allows the School Board to transfer up to $20K between categories in the budget without the Board of Supervisor's approval.

Stafford County Public Schools have successfully integrated the community into the budgetary process which has

Budget Calendar Presented and Adopted School Board	August
Budget Preparation Manual Distributed to Principals and Department Heads	September
Audit of Fiscal Year completed	November
Budget Requests Due to Assistant Superintendents with Input from Staff and Parents	November
Principal/Directors Meet with Superintendent's Leadership Team	November
Public Budget Hearing for Citizens' Input and Employee Group Presentations	November
Establishment of Budget Priorities by School Board	December
Proposed Superindendent's Budget Presented to School Board	January
Budget Work Sessions and Public Hearings are Held by School Board	February
Adoption – Fiscal Year Budget by School Board	February –March
Presentation of School Budget to Board of Supervisors	March
Work Sessions with Board of Supervisors	March–April
Public Hearings on All County Budgets	April
Adoption of All Budgets by Board of Supervisors	April–May
Possible Adjustments by School Board – Input from Staff	May
Appropriation of Funds by Board of Supervisors	May–June
School Site/Department Allocations and Review of Changes	June
Development of School Site Budgets	June

FIGURE 2-4. BUDGET CALENDAR

resulted in outstanding community support for the schools. And by allowing latitude in the way the funds are handled, the Board of Supervisors has promoted more efficient application of funds.

14

SECTION 3

INFORMATION

3.1 PRODUCTION

PIECE PART CONTROL

Computerized Inventory

The Stafford County Public Schools' Central Garage has a computerized inventory control system that also allows for customer billing of parts and labor, and record a history of each vehicle maintained.

The Central Garage maintains 439 vehicles including school buses, trucks, and passenger cars for the county and public schools. When a vehicle is brought to the garage, the identification number, current mileage, date of service, description of mechanical problem, service performed, parts used, and amount of labor required are entered from work orders into a computer. The billable hours and parts used allow the garage to bill the customer for vehicles serviced, and also helps the garage's supervisor account for the mechanics' time. The parts used for a given time are tracked so inventory levels and usage for that time period are known, allowing the parts manager to know when and how many parts to order.

The user can track each vehicle's service record to determine a systematic preventive maintenance schedule using mileage, date performed, and identification number information.

The system allows for inventory control, assists in preventive maintenance scheduling, and billing labor hours and parts to customers. It also indirectly gives the supervisor better control of operations and information to plan for future growth.

3.2 FACILITIES

MODERNIZATION

Transition Plan for Federal Compliance

The Stafford County Public Schools retained an architectural firm to survey all facilities for compliance with the Americans with Disabilities Act, signed into law in 1990. The architectural firm surveyed the facilities and developed a $1.86M cost estimate to bring the school system into compliance. However, by moving the physical location of programs, services, or activities rooms to make them fully accessible and making procedural rather than physical changes, the system was able to develop a transition plan that identified all school/facility obstacles that limited required accessibility. The alterations required to remove these obstacles — at a projected $303K cost — will provide accessibility to disabled individuals to all Stafford County Public Schools programs, activities, and services. This represents a substantial savings over the projected $1.8M reconstruction effort.

3.3 LOGISTICS

LOGISTICS SUPPORT ANALYSIS

Transportation Fleet Utilization

To address growth and pupil transportation problems, Stafford County Public Schools implemented a staggered class start schedule for each of three student grade groups; primary, middle, and secondary. This new schedule was set to maximize bus fleet utilization by allowing most of the buses to run three routes per day.

After this schedule was implemented, the transportation capacity of the system was increased without adding buses, the student age groups were separated, and the bus utilization increased to an average of 101 students per day per bus (the state average is 77 students/bus/day). Further, average annual transportation cost per pupil decreased to $233.12 (state average is $245.71/year).

Automated Bus Routing

The Transportation Department of the Stafford County Public Schools is converting from the traditional manual bus routing process to an automated system. The manual method is highly complex, involving many hand calculations that must be repeated for each iteration when working toward the optimal routing solution.

Stafford County has selected ECOTRAN software that operates on a DOS-based computer linked to an IBM AS/400 that houses student data. The program performs routing optimization for the primary, middle, and secondary school levels. It also accommodates the unique transportation requirements of kindergarten and special education students.

The critical base element of the system is a digital map that contains a street map network, school locations, and

student information. This information is used to develop the safest and most economical bus routes. These factors are then consolidated to ensure efficiency is maintained for the entire fleet. After routes are established, individualized post cards are issued to each student with pertinent instructions on when and where to meet his or her bus.

PERSONNEL REQUIREMENTS

Staff Development Seminars

The primary means for providing for staff development and professional growth is the Staff Development Seminars Program. This program promotes the professional growth of teachers while also addressing the needs of students. It is a multifaceted program for teachers and guest presenters to share information, ideas, and techniques with their peers.

In most Virginia school systems, teacher professional development is addressed by requiring teachers to attend two days of in-service seminars or workshops during the school year. The in-service seminars are conducted on dedicated teacher days and are usually large scale sessions addressing broad areas. While this training helps teachers meet requirements for maintaining state licensing and certification requirements, it does not effectively meet the specific needs of individual teachers, schools, and their students.

In 1990, Stafford implemented the Staff Development Seminars program that includes training programs and activities to improve skills, attitudes, understandings, and performance of staff in present and future roles. The number of seminars offered has grown from 122 in the 1991-1992 school year to 247 different seminars offered during the 1993-1994 school year.

Seminars are offered in learning styles, teaming for instruction, cooperative learning, the writing process, study skills, application of technology, mainstreaming/differentiating instruction, classroom management/student motivation, integrated language arts instruction, student assessment, social issues/educational impact, math/sciences initiatives, and content specific initiatives.

Teachers must take two seminars each year. The seminars are offered throughout the year including Saturdays, Sundays, evenings, and summer vacation. This allows teachers to "opt-out" of the scheduled contract days for in-service training by taking seminars when they want, or at more convenient times. The variety of seminars makes it possible to effectively meet specific development needs of individuals as well as the school system needs for staff development.

Comprehensive catalogues listing seminar descriptions and schedules are published for Fall, Spring, and Summer sessions. Each seminar that a teacher attends counts as one

in-service day, and teachers receive appropriate points toward recertification. The seminars are conducted by school staff and outside consultants. Staff members who teach seminars may fulfill the requirement for attendance at one seminar for each seminar taught. Seminar size is normally limited to 25 participants with the emphasis on hands- on, personalized learning experiences.

Stafford uses a commercially available software package called Professional Development Manager Plus to manage the information needed to administer the Staff Development Seminars program. It maintains all the program information, tracks registration and attendance, generates schedules, tracks recertification points accrued, generates required reports and letters, produces consultant contracts, and produces the seminar catalogue book.

The Staff Development Seminars program has proven to be more effective in meeting staff development needs than the traditional in-service approach. It is highly regarded by the teachers because of the variety and quality of seminar offerings and the personalized, hands-on approach. Figure 3-1 shows the number of participants for each specific need area for seminars offered in 1993-94 and indicates the diversity of interests. The program also offers a great deal of flexibility for scheduling and for adapting to the changing needs of the school system and individual staff members.

Performance Appraisal

The Stafford County Schools use two models — the Professional Growth Model and the Accountability Model — to evaluate professional staff, teachers, counselors, librarians, and nontechnical specialists and to promote professional growth.

The Professional Growth Model is used to evaluate staff members who have achieved continuing contract status and professional staff members exempt from the Professional Accountability Model. The benefits in the application of the model are its flexibility, individuality, and open-ended characteristics. The components of the model are goal setting, strategies, activities, a time line, and the evaluation criteria. One unique aspect of this model in the educational environment is the application of the characteristics individually or as a team. Items that may be included in the Professional Growth Plan are college credits, professional conferences, peer observations, publications, mentorship programs, and professional activities.

The Professional Accountability Model is applied to staff members during their first year in the school system, any staff member who chooses to use it, or if it is recommended by the evaluator. It is also applied to probationary professional staff members. This model ensures that professional staff members understand and are supportive of Division
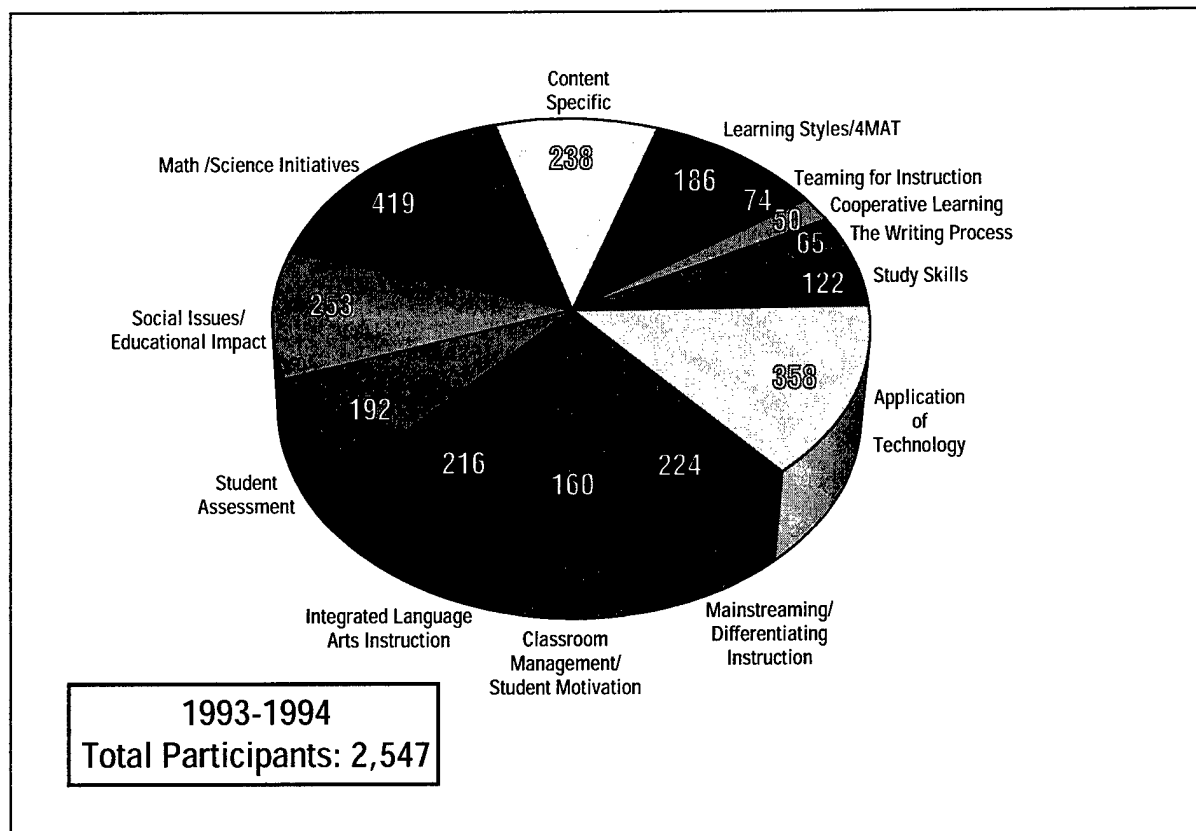
FIGURE 3-1. SEMINAR PARTICIPATION BY NEED AREA

and school objectives. The model is comprised of four components - Observation, Objectives, Professional Responsibility, and Evaluation Report and Conference. Under Observation, the evaluator (immediate supervisor) will visit the teacher's classroom three times during the school year in October, December, and March. The visit may be announced or unannounced, and it must consist of a full class period or a complete activity. A staff member with no

previous experience is not required to develop an objective; all other professional staff are required to develop one objective that is mutually agreed upon between the professional staff member and the evaluator.

The personnel improvement and evaluation process promotes personal and professional growth so that the teaching and learning process and services available to the students will be more effective.

APPENDIX A

BMP SURVEY TEAM

Team Member	Agency	Function
Larry Robertson (812) 854-5336	**Crane Division** **Naval Surface Warfare Center** Crane, IN	**Team Chairman**
Amy Scanlan (703) 271-9055	**BMP Representative** Washington, DC	**Technical Writer**

Team A

John Carney (703) 602-3003	**Carderock Division** **Naval Surface Warfare Center** Washington, DC	**Team Leader**
Rick King (812) 854-5131	**Crane Division** **Naval Surface Warfare Center** Crane, IN	

Team B

Rick Purcell (703) 271-9055	**BMP Representative** Washington, DC	**Team Leader**
Larry Halbig (317) 353-3838	**Aircraft Division-Indianapolis** **Naval Air Warfare Center** Indianapolis, IN	
Monica Faurote (317) 353-7109	**Aircraft Division-Indianapolis** **Naval Air Warfare Center** Indianapolis, IN	
Al Mense (703) 271-9055	**BMP Representative** Washington, DC	

APPENDIX B

PROGRAM MANAGER'S WORKSTATION

The Program Manager's Workstation (PMWS) is a series of expert systems that provides the user with knowledge, insight, and experience on how to manage a program, address technical risk management, and find solutions that industry leaders are using to reduce technical risk and improve quality and productivity. This system is divided into four main components; KNOW-HOW, Technical Risk Identification and Mitigation System (TRIMS), BMP Database, and Best Manufacturing Practices Network (BMPNET).

- **KNOW-HOW** is an intelligent, automated method that turns "Handbooks" into expert systems, or digitized text. It provides rapid access to information in existing handbooks including Acquisition Streamlining, Non-Development Items, Value Engineering, NAVSO P-6071 (Best Practices Manual), MIL- STD-2167/2768, SecNav 5000.2A and the DoD 5000 series documents.

Powerful

PMWS
1. Knowledge
2. Insight
3. Experience

Easy — — Consistent

Integrated

PROGRAM MANAGER'S WORKSTATION

- **TRIMS** is based on DoD 4245.7-M (the transition templates), NAVSO P-6071 and DoD 5000 event oriented acquisition. It identifies and ranks the high risk areas in a program. TRIMS conducts a full range of risk assessments throughout the acquisition process so corrective action can be initiated before risks develop into problems. It also tracks key project documentation from concept through production including goals, responsible personnel, and next action dates for future activities in the development and acquisition process.

- The **BMP Database** draws information from industry, government, and the academic communities to include documented and proven best practices in design, test, production, facilities, management, and logistics.

Each practice in the database has been observed and verified by a team of experienced government engineers. All information gathered from BMP surveys is included in the BMP Database, including this survey report.

- **BMPNET** provides communication between all PMWS users. Features include downloading of all programs, E-mail, file transfer, help "lines", Special Interest Groups (SIGs), electronic conference rooms and much more. Through BMPNET, IBM or compatible PC's and Macintosh computers can run all PMWS programs.

- To access **BMPNET** efficiently, users need a special modem program. This program can be obtained by calling the BMPNET using a VT-100/200 terminal emulator set to 8,N,1. Dial (703) 538-7697 for 2400 baud modems and (703) 538-7267 for 9600 baud and 14.4 kb. When asked for a user profile, type: DOWNPC or DOWNMAC <return> as appropriate. This will automatically start the Download of our special modem program. You can then call back using this program and access all BMPNET functions. The General User account is:

USER PROFILE: BMPNET

USER I.D.: BMP

Password: BMPNET

If you desire your own personal account (so that you may receive E-Mail), just E-Mail a request to either Ernie Renner (BMP Director) or Brian Willoughby (CSC Program Manager). If you encounter problems please call (703) 538-7799.
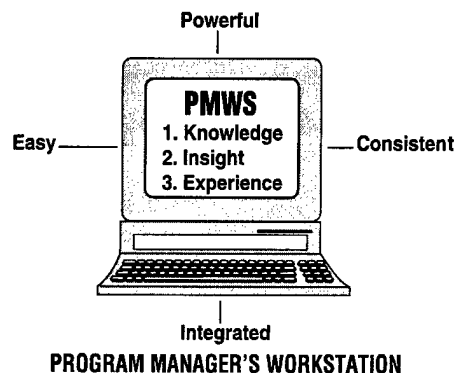
APPENDIX C

NAVY CENTERS OF EXCELLENCE

Automated Manufacturing Research Facility
(301) 975-3414

The Automated Manufacturing Research Facility (AMRF) – a National Center of Excellence – is a research test bed at the National Institute of Standards and Technology located in Gaithersburg, Maryland. The AMRF produces technical results and transfers them to the Navy and industry to solve problems of automated manufacturing. The AMRF supports the technical work required for developing industry standards for automated manufacturing. It is a common ground where industry, academia, and government work together to address pressing national needs for increased quality, greater flexibility, reduced costs, and shorter manufacturing cycle times. These needs drive the adoption of new computer-integrated manufacturing technology in both civilian and defense sectors. The AMRF is meeting the challenge of integrating these technologies into practical, working manufacturing systems.

Electronics Manufacturing Productivity Facility
(317) 226-5607

Located in Indianapolis, Indiana, the Electronics Manufacturing Productivity Facility (EMPF) is a National Center of Excellence established to advance state-of-the-art electronics and to increase productivity in electronics manufacturing. The EMPF works with industry, academia, and government to identify, develop, transfer, and implement innovative electronics manufacturing technologies, processes, and practices. The EMPF conducts applied research, development, and proof-of-concept electronics manufacturing and design technologies, processes, and practices. It also seeks to improve education and training curricula, instruction, and necessary delivery methods. In addition, the EMPF is striving to identify, implement, and promote new electronics manufacturing technologies, processes, materials, and practices that will eliminate or reduce damage to the environment.

National Center for Excellence in Metalworking Technology
(814) 269-2420

The National Center for Excellence in Metalworking Technology (NCEMT) is located in Johnstown, Pennsylvania and is operated by Concurrent Technologies Corporation (CTC), a subsidiary of the University of Pittsburgh Trust. In support of the NCEMT mission, CTC's primary focus includes working with government and industry to develop improved manufacturing technologies including advanced methods, materials, and processes, and transfer-

ring those technologies into industrial applications. CTC maintains capabilities in discrete part design, computerized process analysis and modeling, environmentally compliant manufacturing processes, and the application of advanced information science technologies to product and process integration.

Center of Excellence for Composites Manufacturing Technology
(414) 947-8900

The Center of Excellence for Composites Manufacturing Technology (CECMT), a national resource, is located in Kenosha, Wisconsin. Established as a cooperative effort between government and industry to develop and disseminate this technology, CECMT ensures that robust processes and products using new composites are available to manufacturers. CECMT is operated by the Great Lakes Composites Consortium. It represents a collaborative approach to provide effective advanced composites technology that can be introduced into industrial processes in a timely manner. Fostering manufacturing capabilities for composites manufacturing will enable the U.S. to achieve worldwide prominence in this critical technology.

Navy Joining Center
(614) 486-9423

The Navy Joining Center (NJC) is a Center of Excellence established to provide a national resource for the development of materials joining expertise, deployment of emerging manufacturing technologies, and dissemination of information to Navy contractors, subcontractors, Navy activities, and U.S. industry.

The NJC is located in Columbus, Ohio, and is operated by Edison Welding Institute (EWI), the nation's largest industrial consortium dedicated to materials joining. The NJC combines these resources with an assortment of facilities and demonstrated capabilities from a team of industrial and academic partners. NJC technical activities are divided into three categories - Technology Development, Technology Deployment, and Technology Transfer. Technology Development maintains a goal to complete development quickly to initiate deployment activities in a timely manner. Technology Deployment includes projects for rapid deployment teaming and commercialization of specific technologies. The Technology Transfer department works to disseminate pertinent information on past and current joining technologies both at and above the shop floor.

APPENDIX D

NEW BEST MANUFACTURING PRACTICES PROGRAM TEMPLATES

Since 1985, the BMP Program has applied the templates philosophy with well-documented benefits. Aside from the value of the templates, the templates methodology has proven successful in presenting and organizing technical information. Therefore, the BMP program is continuing this existing "knowledge" base by developing 17 new templates that complement the existing DoD 4245.7-M or Transition from Design to Production templates.

The development of these new templates was based in part on Defense Science Board studies that have identified new technologies and processes that have proven successful in the last few years. Increased benefits could be realized if these activities were made subsets of the existing, compatible templates.

Also, the BMP Survey teams have become experienced in classifying Best Practices and in technology transfer.

The Survey team members, experts in each of their individual fields, determined that data collected, while related to one or more template areas, was not entirely applicable. Therefore, if additional categories were available for Best Practices "mapping," technology transfer would be enhanced.

Finally, users of the Technical Risk Identification and Mitigation System (TRIMS) found that the program performed extremely well in tracking most key program documentation. However, additional categories – or templates – would allow the system to track all key documentation.

Based on the above identified areas, a core group of activities was identified and added to the "templates baseline." In addition, TRIMS was modified to allow individual users to add an unlimited number of user-specific categories, templates, and knowledge-based questions.

APPENDIX E

COMPLETED SURVEYS

BMP surveys have been conducted at the companies listed below. Copies of older survey reports may be obtained through DTIC or by accessing the BMPNET. Requests for copies of recent survey reports or inquiries regarding the BMPNET may be directed to:

Best Manufacturing Practices Program
4321 Hartwick Rd.
Suite 308
College Park, MD 20740
Attn: Mr. Ernie Renner, Director
Telephone: 1-800-789-4267
FAX: (301) 403-8180

COMPANIES SURVEYED

Litton
Guidance & Control Systems Division
Woodland Hills, CA
October 1985 and February 1991

Texas Instruments
Defense Systems & Electronics Group
Lewisville, TX
May 1986 and November 1991

Harris Corporation
Government Support Systems Division
Syosset, NY
September 1986

Control Data Corporation
Government Systems Division
(Computing Devices International)
Minneapolis, MN
December 1986 and October 1992

ITT
Avionics Division
Clifton, NJ
September 1987

UNISYS
Computer Systems Division
(Paramax)
St. Paul, MN
November 1987

Honeywell, Incorporated
Undersea Systems Division
(Alliant Tech Systems, Inc.)
Hopkins, MN
January 1986

General Dynamics
Pomona Division
Pomona, CA
August 1986

IBM Corporation
Federal Systems Division
Owego, NY
October 1986

Hughes Aircraft Company
Radar Systems Group
Los Angeles, CA
January 1987

Rockwell International Corporation
Collins Defense Communications
Cedar Rapids, IA
October 1987

Motorola
Government Electronics Group
Scottsdale, AZ
March 1988

General Dynamics
Fort Worth Division
Fort Worth, TX
May 1988

Texas Instruments
Defense Systems & Electronics Group
Dallas, TX
June 1988

Hughes Aircraft Company
Missile Systems Group
Tucson, AZ
August 1988

Bell Helicopter
Textron, Inc.
Fort Worth, TX
October 1988

Litton
Data Systems Division
Van Nuys, CA
October 1988

GTE
C^3 Systems Sector
Needham Heights, MA
November 1988

McDonnell-Douglas Corporation
McDonnell Aircraft Company
St. Louis, MO
January 1989

Northrop Corporation
Aircraft Division
Hawthorne, CA
March 1989

Litton
Applied Technology Division
San Jose, CA
April 1989

Litton
Amecom Division
College Park, MD
June 1989

Standard Industries
LaMirada, CA
June 1989

Engineered Circuit Research, Incorporated
Milpitas, CA
July 1989

Teledyne Industries Incorporated
Electronics Division
Newbury Park, CA
July 1989

Lockheed Aeronautical Systems Company
Marietta, GA
August 1989

Lockheed Corporation
Missile Systems Division
Sunnyvale, CA
August 1989

Westinghouse
Electronic Systems Group
Baltimore, MD
September 1989

General Electric
Naval & Drive Turbine Systems
Fitchburg, MA
October 1989

Rockwell International Corporation
Autonetics Electronics Systems
Anaheim, CA
November 1989

TRICOR Systems, Incorporated
Elgin, IL
November 1989

Hughes Aircraft Company
Ground Systems Group
Fullerton, CA
January 1990

TRW
Military Electronics and Avionics Division
San Diego, CA
March 1990

MechTronics of Arizona, Inc.
Phoenix, AZ
April 1990

E-2

Boeing Aerospace & Electronics
Corinth, TX
May 1990

Textron Lycoming
Stratford, CT
November 1990

Naval Avionics Center
Indianapolis, IN
June 1991

Kurt Manufacturing Co.
Minneapolis, MN
July 1991

Raytheon Missile Systems Division
Andover, MA
August 1991

Tandem Computers
Cupertino, CA
January 1992

Conax Florida Corporation
St. Petersburg, FL
May 1992

Hewlett-Packard
Palo Alto Fabrication Center
Palo Alto, CA
June 1992

Digital Equipment Company
Enclosures Business
Westfield, MA and
Maynard, MA
August 1992

NASA Marshall Space Flight Center
Huntsville, AL
January 1993

Department of Energy-
Oak Ridge Facilities
Operated by Martin Marietta Energy Systems, Inc.
Oak Ridge, TN
March 1993

Technology Matrix Consortium
Traverse City, MI
August 1990

Norden Systems, Inc.
Norwalk, CT
May 1991

United Electric Controls
Watertown, MA
June 1991

MagneTek Defense Systems
Anaheim, CA
August 1991

AT&T Federal Systems Advanced
Technologies and AT&T Bell Laboratories
Greensboro, NC and Whippany, NJ
September 1991

Charleston Naval Shipyard
Charleston, SC
April 1992

Texas Instruments
Semiconductor Group
Military Products
Midland, TX
June 1992

Watervliet U.S. Army Arsenal
Watervliet, NY
July 1992

Naval Aviation Depot
Naval Air Station
Pensacola, FL
November 1992

Naval Aviation Depot
Naval Air Station
Jacksonville, FL
March 1993

McDonnell Douglas Aerospace
Huntington Beach, CA
April 1993

Crane Division
Naval Surface Warefare Center
Crane, IN and Louisville, KY
May 1993

R. J. Reynolds Tobacco Company
Winston-Salem, NC
July 1993

Hamilton Standard
Electronic Manufacturing Facility
Farmington, CT
October 1993

Harris Semiconductor
Melbourne, FL
January 1994

Naval Undersea Warfare Center
Division Keyport
Keyport, WA
May 1994

Stafford County Public Schools
Stafford County, VA
August 1994

Philadelphia Naval Shipyard
Philadelphia, PA
June 1993

Crystal Gateway Marriott Hotel
Arlington, VA
August 1993

Alpha Industries, Inc
Methuen, MA
November 1993

United Defense, L.P.
Ground Systems Division
San Jose, CA
March 1994

Mason & Hanger
Silas Mason Co., Inc.
Middletown, IA
July 1994

INTERNET DOCUMENT INFORMATION FORM

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B. DATE Report Downloaded From the Internet: 01/14/02

C. Report's Point of Contact: (Name, Organization, Address, Office Symbol, & Ph #): **Best Manufacturing Practices Center of Excellence College Park, MD**

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